

Slavomír Hanzely

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Synopses

- **Researcher** tackling problems on the boundary of Mathematics and Computer Science. Enjoying testing my skills against new challenges
- Proven performance in working independently, collaborating with peers, and leading projects
- Efficiently communicates complex ideas to audiences of all levels and cultures
- Qualities: quick learner, persistent, well-organized, high attention to details

Expertise

Optimization, machine learning, federated learning, mathematics, algorithms, programming

Education

King Abdullah University of Science and Technology ([link](#)), Saudi Arabia

Ph.D., Applied Mathematics and Computational Sciences 2023 (expected)

MSc., Applied Mathematics and Computational Sciences 2020

Topic: Optimization for Machine Learning, group of prof. [Peter Richtárik](#)

Comenius University ([link](#)), Slovakia

BSc., Computer Science 2019

Thesis: Random sampling from uniform distribution on multidimensional polyhedra

Publications

- Sketch-and-project meets Newton method: global $\mathcal{O}(1/k^2)$ convergence with low-rank updates, Hanzely, FL workshop, ICML 2023, [arxiv link](#)
- Convergence of first-order algorithms for meta-learning, FL workshop, ICML 2023 ([link](#)) Mishchenko, Hanzely, Richtárik
- A damped Newton method achieves global $\mathcal{O}(1/k^2)$ convergence rate, [NeurIPS 2022](#) Hanzely, Kamzolov, Pasechnyuk, Gasnikov, Richtárik, Takáč
- Distributed Newton-type methods with communication compression, [arxiv 2022](#) Islamov, Qian, Hanzely, Safaryan, Richtárik
- ZeroSARAH: nonconvex optimization with zero gull gradient computation, [arxiv 2021](#) Li, Hanzely and Richtárik
- Lower bounds & optimal algorithms for personalized federated learning, [NeurIPS 2020](#) F. Hanzely, S. Hanzely, Horváth and Richtárik
- Adaptive learning of the optimal mini-batch size of SGD, [OPT-ML](#), [NeurIPS 2020](#) Alfarra, Hanzely, Albasyoni, Ghanem and Richtárik

Presentations

Conferences: NeurIPS 22, ICCOPT 22, ICML 23, Rising Stars in AI, Mathematics in Armenia
Institutes: ISTA Austria, École Polytechnique, MBZUAI, KINIT, Flatiron Institute

Awards

King Abdullah University of Science and Technology ([link](#))

- Student research excellence awards (4 consecutive years: 2020, 2021, 2022, 2023)
 - an annual award to top KAUST student(s) in program Applied Mathematics
- Ph.D. scholarship of USD 75,000/year
- MSc. scholarship of USD 70,000/year

Vojtech Jarník International Mathematical Competition ([link](#))

2017: 8-10th place (39 universities participated)

Mathematical Olympiad ([link](#))

2016: 3rd place, Slovak national round
 International Mathematical Olympiad participation
 2015: bronze medal, Middle European Mathematical Olympiad

Work Experience	Flatiron Institute, Simons Foundation (link) <i>Research associate, group of R. Gower</i> Investigated ML loss reformulations and designed fast variance-reduced algorithms June 2022 – July 2022
	Mohamed bin Zayed University of AI (link) <i>Research assistant, group of M. Takáč</i> Developed second-order optimization methods that are fast, practical and provably convergent • Resulting in a paper accepted at NeurIPS 2022 (link) Feb 2022 – Apr 2022
	Wincent (link) (crypto trading company) <i>Research intern / software engineer</i> Analyzed, modeled, designed practical algorithms to optimize resource allocation of the company; and implemented the developed methods under various constraints Jun 2020 – Aug 2020
	Mathematical Olympiad (link) • Marked problems at the national round (3 times) • Organized national selection camp for the International Mathematical Olympiad – restructured format of the camp and created all problem sets (team of 4 people) – created the problem sets for a day and marked the solutions (3 times) 2017 – 2019
Extracurricular Activities	Trojsten (link) (nonprofit organization) <i>Volunteer</i> • Prepared competitions and camps (in Math & CS) for talented high school students – co-organized 14 competitions (3 as a head organizer) – co-organized 20 camps (4 as a head organizer) – problem selection: 20 problem sets, ~200 hours of work – marked solutions: ~600 solutions, ~150 hours of work • Lectured: delivered 38 lectures (including a half-day lecture) 2016 – 2019
	King Abdullah University of Science and Technology (link) <i>Teaching assistant for federated learning research</i> Assisting students with following aspects of research: project choice, literature review, algorithm development, experiment design, result presentation, write-up & submission

Technical skills Research

- Topics: federated learning, higher-order algorithms, stochastic optimization
- Reviewing: TLMR (journal, exceptional reviewer), NeurIPS (conference), ICML (conference)
- Qualities: patience, persistence, well-organized

Programming

- Python, PyTorch, C/C++, SQL, Bash, Julia
- Flexibility: experience with Matlab, R, Mathematica, Java, Javascript, Haskell
- Real-life time saving: automatization of recurring tasks (sending mails, filling forms, ...)

Cross-cultural communication

- Co-organized a large ultimate frisbee tournament
 (largest tournament in MENA region & first mixed tournament in Saudi Arabia)
- Studying and working in various international communities
- Organizing a research group seminar
- Organizing a research session at IFORS 2023 conference
- Languages: English, Slovak, French (basics), Russian (passive), Spanish (passive)